



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/956,890	09/21/2001	Koshiro Ochiai	2185-0575P-SP	2422

2292 7590 08/21/2003

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

SASTRI, SATYA B

ART UNIT	PAPER NUMBER
----------	--------------

1713

DATE MAILED: 08/21/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/956,890

Applicant(s)

OCHIAI ET AL.

Examiner

Satya B Sastri

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-10 is/are rejected.
- 7) ☒ Claim(s) 1,3 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the amendment filed on June 10, 2003. With the cancellation of *claims 5 and 6*, *claims 1-4 and 7-10* are now pending in the application. In view of the applicant's amendment of the claims, rejection of *claims 1-4* under 35 U.S.C. 102(e) as being anticipated by Uchiumi et al. (Us 6,329,480 B1) is withdrawn, rejection of *claim 7* under U.S.C. 103 (a) as being obvious over Uchiumi et al. in view of Wojtech et al. (US 5,073,622) is sustained.

Response to Applicants

2. The argument that the resins are useful as resins for resist for high-energy radiations is viewed only as an intended use of the material and not a claim limitation. In regard to relevance of the prior art to Uchiumi et al., the reference teaches that no particular limitation is imposed on the nature of acrylic acid ester to be used and that any alcoholic component may be used (column 8, lines 51-55). The resins may be washed by acidic aqueous solutions and examples include a genus of six acids of which the one species reads on the claimed polycarboxylic acid (column 18, lines 27-30). Even though the prior art does not expressly teach the combination of a (meth)acrylate resin derived from a tertiary carbon containing alcoholic fragment and a polycarboxylic acid based washing solution, the metal fragments of all polymers derived from

Art Unit: 1713

the disclosed monomers in column 8 are expected to be removed equally efficiently by any of the disclosed acidic solutions.

3. Applicants' argue that the prior art to Wojtech et al. does not teach the washing procedure with (poly)methacrylate resins. It is noted that the prior art teaches that metal contents in resin compositions for photoresists may be efficiently reduced through the use of complex-forming compounds and demonstrates the functional equivalence of oxalic acid, malonic acid, succinic acid and maleic acid with citric acid (column 3, lines 1-18).

Specification

4. A typographical error is noted on page 5, line 21 (1 to 100 **holds**) of the specification.

5. The description of the resin with a bound site as being a tertiary carbon or an acetal in *claim 1* is vague and ambiguous and is objected to.

6. *Claim 4* is objected to for not stating the R₁ groups in the alternative.

7. *Claim 3* is objected to for including 1-methoxyethyl and 1-ethoxyethyl that do not qualify as acetals or tertiary carbon containing fragments.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. ***Claims 1-4, 8*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiumi et al. (Us 6,329,480 B1).

Uchiumi et al. disclose the process for the preparation of acrylic acid ester polymer that includes carrying out polymerization of an acrylic acid ester or block copolymerization of an acrylic acid ester and another (meth)acrylic monomer in the presence of an organometallic compound (abstract, lines 1-5). Uchiumi et al. further disclose that for the removal of the metal compound, it is effective to subject the acrylic acid ester polymer to cleaning treatment such as washing treatment such as washing treatment with an acidic aqueous solution (column 18, lines 12-15). Additionally, Uchiumi et al. include that it is preferred to wash the acrylic acid ester polymer with an acidic aqueous solution as soon as possible after the termination of the polymerization, whereby metal components can be removed with high efficiency (column 18, lines 23-27).

The difference between the present invention and the prior art is that the present invention discloses washing a specific poly (meth)acrylate containing a tertiary carbon atom or

Art Unit: 1713

an acetal in the alcohol fragment of the ester with a polycarboxylic acid containing aqueous solution to reduce the metal content whereas the prior art includes a variety of resins that can be washed with acids that include polycarboxylic acids such as that disclosed in the instant invention.

The prior art reference teaches that no particular limitation is imposed on the nature of acrylic acid ester to be used and that any alcoholic component may be used (column 8, lines 51-55). The disclosure further includes as examples, esters derived from primary, secondary and tertiary alcohols (column 3, lines 55-65). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to include any (meth)acrylic ester including a tertiary-carbon containing t-butyl ester (column 3, line 64) and thereby obtain the present invention. In as far as the acidic aqueous solutions are concerned, the prior art includes a genus of six acids of which the one species (citric acid) reads on the claimed polycarboxylic acid (column 18, lines 27-30). Even though the prior art does not expressly teach the combination of a (meth)acrylate resin derived from a tertiary carbon containing alcoholic fragment and a polycarboxylic acid based washing solution, the metal fragments of all polymers derived from the disclosed monomers in column 8 are expected to be removed equally efficiently by any of the disclosed acidic solutions. In the instant case substitution of equivalent compounds requires no express motivation, as long as the prior art recognizes equivalency, *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. V. Linde Air products Co.* 85 USPQ 328 (USSC 1950).

Art Unit: 1713

10. *Claims 7, 9 and 10* are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiumi et al. (US 6,329,480 B1) in view of Wojtech et al. (US 5,073,622).

The disclosure of Uchiumi et al. is adequately set forth in paragraph 3 and is incorporated herein by reference.

The difference between Uchiumi et al. and the present invention is the specific use polyprotic carboxylic acid selected from the list of oxalic acid, succinic acid, fumaric acid, maleic acid, malonic acid and adipic acid.

Wojtech et al. disclose a process for the preparation of novolac resins having a low amount of metal ions wherein the resin in an organic solution is brought in contact with an acidic, preferably an acid compound which is preferably in an aqueous phase (abstract, lines 1-7). Preferred organic acids include oxalic acid, malonic acid, succinic acid and malonic acid (column 3, lines 8-10) as well as tartaric acid, citric acid, mesoxalic acid and ascorbic acid. Given the functional equivalence of the various polyprotic acids, it would have been obvious for one of ordinary skill in the art at the time the invention was made to include any of the complex-forming acids to wash the acrylic ester polymers of Uchiumi et al. and thereby obtain the present invention.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1713

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at telephone number is (703) 305-8490.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached at (703) 308-2450.

Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 308-0661.

SATYA SASTRI

August 19, 2003



DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700